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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 09/857,698   | 11/09/2001  | Paul Berger          | C1043/7032          | 9935             |
| 7590 04/22/2004  |             |                      | EXAMINER            |                  |
| Finnegan, Henderson, Farabow, Garrett & Dunner<br>1300 I Street, NW<br>Washington, DC 20005-3315 |             |                      | LEURIG, CHARLENE L  |                  |
|  |             |                      | ART UNIT            | PAPER NUMBER     |
|  |             |                      | 2879                |                  |

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                 |               |  |
|------------------------------|-----------------|---------------|--|
| <b>Office Action Summary</b> | Applicant(s)    | Applicant(s)  |  |
|                              | 09/857,698      | BERGER ET AL. |  |
|                              | Examiner        | Art Unit      |  |
|                              | Sharlene Leurig | 2879          |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 March 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 36-42 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 36 and 40-42 is/are rejected.
- 7) ☒ Claim(s) 37-39 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>010504</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Response to Amendment***

1. The amendment filed on March 22, 2004 has been entered and acknowledged by the examiner. Claims 1-35 have been cancelled and claims 36-42 have been added.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 36 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bulovic et al. (5,834,893) in view of Matsumoto (5,157,468).

Regarding claim 36, Bulovic discloses a light-emissive device comprising a light emissive region (Figure 5, element 54), a first electrode (51) located on a viewing side of the light-emissive region for injecting charge carriers of a first type, a second electrode (55 and 61), comprising a transparent layer (61), located on a non-viewing side of the light-emissive region for injecting charge carriers of a second type, and a contrast-enhancing structure (62) located on the non-viewing side of the light-emissive region and including a distributed Bragg reflector, wherein the transparent layer (61) is located between the distributed Bragg reflector and the light-emissive region. Bulovic further discloses that the Bragg reflector structure contributes to the spectral narrowing of the emitted light, which increases the efficiency of the OLED.

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Bulovic lacks explicit disclosure of the peak reflectivity of the Bragg reflector.

Matsumoto teaches a light-emissive device having a Bragg reflector positioned adjacent a second transparent electrode. The Bragg reflector has a peak reflectivity that encompasses an emission wavelength of the light-emissive region, as shown in Figure 4B, in order to reflect the most emitted light possible to increase the efficiency of the device.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the OEL of Bulovic to have a Bragg reflector that has a peak reflectivity that falls within the emissive range of the EL layer, as taught by Matsumoto, in order to maximize the emissive efficiency of the device.

Regarding claim 40, Bulovic discloses a second electrode comprising an electrically conductive material.

4. Claims 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bulovic et al. (5,834,893) in view of Matsumoto (5,157,468) as applied to claims 36 and 40 above, and further in view of Hosokawa (JP 08-222374) (of record).

Bulovic discloses a light-emitting device having a distributed Bragg reflector and an emissive layer composed of Alq (column 4, line 19). Bulovic further discloses that the EL layer material can be changed to achieve the desired wavelength of emission (column 4, line 45).

Bulovic lacks disclosure of the reflectivity peak of the Bragg reflector.

Matsumoto teaches a distributed Bragg reflector for a light-emissive device with a peak reflectivity within the range of emitted light in order to increase the device's emissive efficiency.

Both Bulovic and Matsumoto lack explicit disclosure of an emissive layer formed of polymer or conjugated polymer material.

Hosokawa teaches a variety of common luminescent substances for use in an organic light-emitting device, including conjugated polymer materials such as poly-alkyl fluorene (paragraph 0016).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Bulovic's light-emitting device having a Bragg reflector so that the reflector has a reflectivity peak in the range of emitted light in order to maximize the efficiency of the device, as taught by Matsumoto, and to further modify it to have an emissive material comprising a polymer material such as a conjugated polymer material, since conjugated light-emitting polymers have been shown to be well-known in the art by Hosokawa, in order to provide the desired wavelength of emission.

#### ***Allowable Subject Matter***

5. Claims 37-39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
6. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to teach or suggest the combination of limitations as

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set forth in claim 37, and specifically comprising the limitation of the second electrode having a layer between the reflector and the emissive layer and another layer formed on the non-viewing side of the reflector and the reflector having a number of through-paths to provide a path of electrical connection between the second electrode layer on the non-viewing side of the reflector and the emissive layer.

### ***Response to Arguments***

7. Applicant's arguments with respect to claims 36-42 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharlene Leurig whose telephone number is (571) 272-2455. The examiner can normally be reached on Monday through Friday, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

sll



ASHOK PATEL  
PRIMARY EXAMINER